

# Shaping of Optical Appearance of Carbon Fibres

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Carbon Fibre-Reinforced Polymers (CFRPs) are mainly used in structural applications. Research was focused on mechanical properties in the past. Since CFRP surfaces are increasingly used in high quality applications, shaping their optical appearance is becoming of scientific and industrial interest.

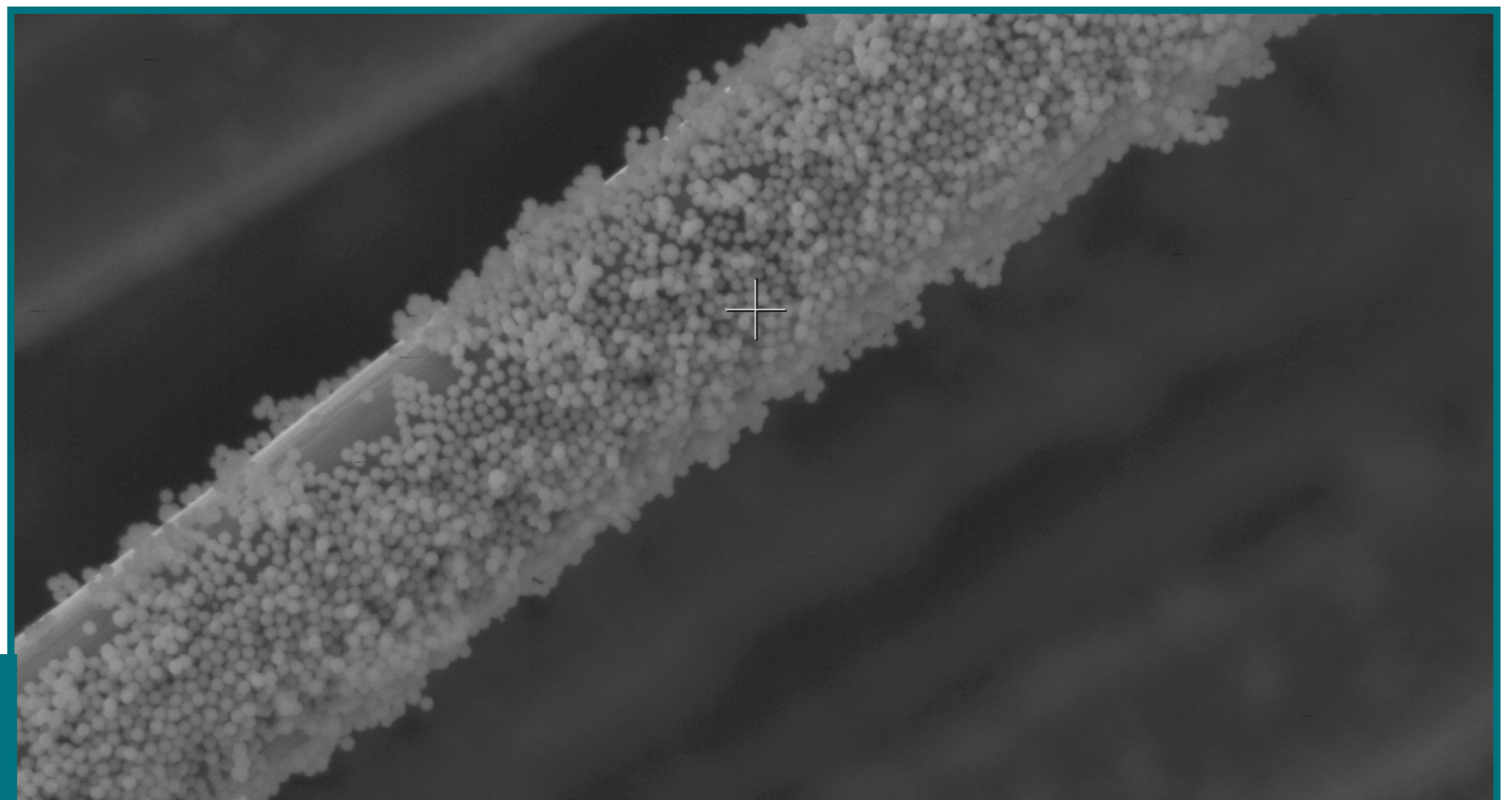
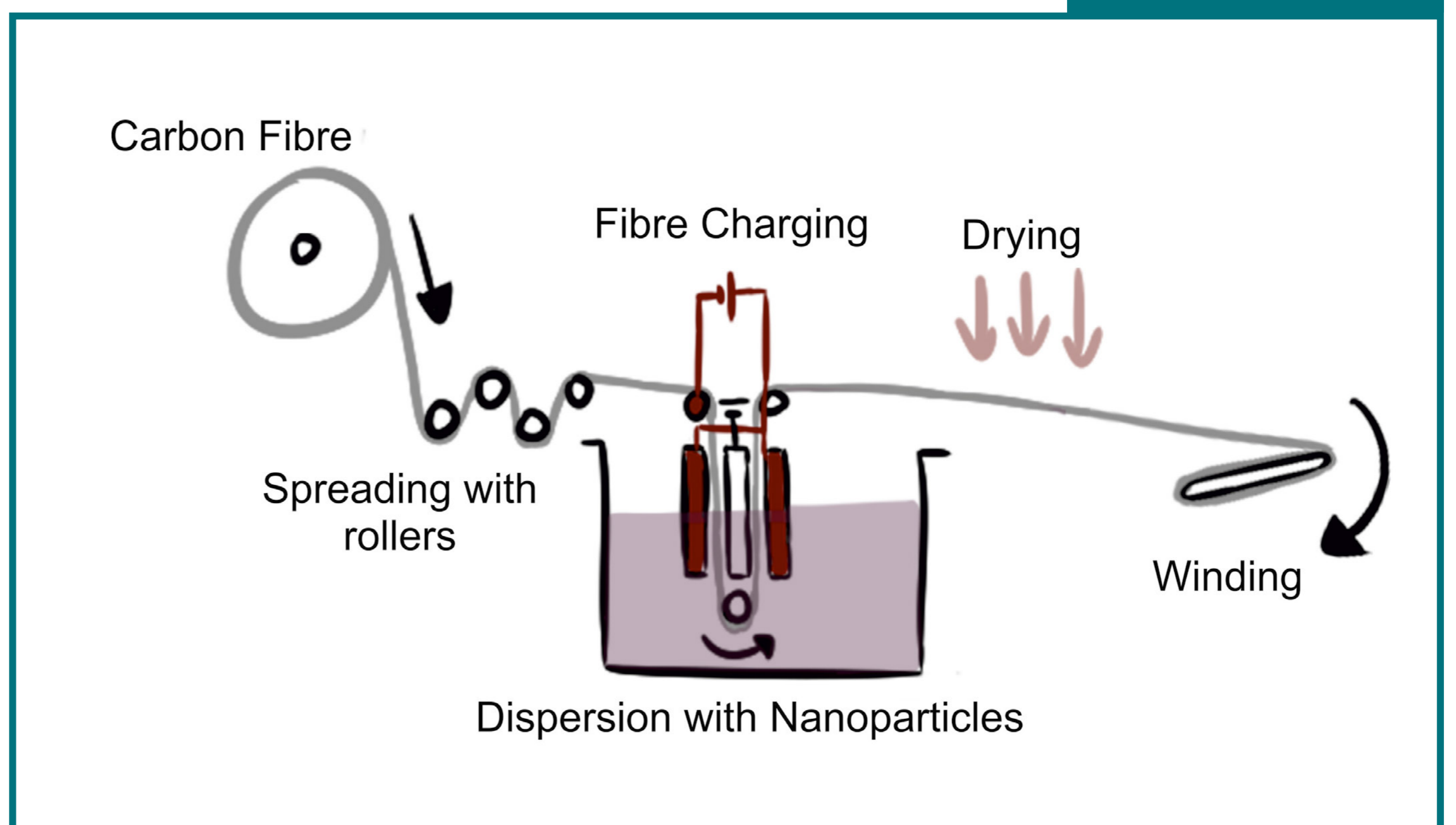


Fig. 1: SEM image of a single carbon fibre (type AS4 12k) after EPD with Silica Nanoparticles (400 nm)

One of the tasks in this project is using electrophoretic deposition (EPD) to modify carbon fibres with differently shaped and sized nanoparticles. The aim is to modify optical properties of the carbon fibres by generating hierarchical structures on the fibre surface. For choosing these particles a simulation is performed to define the optimal size and shape. Afterwards a stable dispersion is prepared for the EPD where the fibre is pulled through. With these modified fibres CFRP laminates are produced with a resin transfer moulding process. Finally optical measurements in the visible and UV-range are carried out to check the predictions of the simulation against the experiments and to optimize calculations.

Fig. 2: Implementation of citric acid on the flax fiber surface and manufacturing of a 100% bio-based composite



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**RESEARCH FOCUS:** Simulation and modification of CFRP surfaces

**PROJECT:** Nanostructured hierarchical CFRP surfaces for tailored visual appearance and improved durability

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